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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,081	12/11/2003	Jingyue Ju	0575/68576-A/JPW/AJM/BJA	1586

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Cooper & Dunham LLP
1185 Avenue of the Americas
New York, NY 10036

EXAMINER

STAPLES, MARK

ART UNIT	PAPER NUMBER
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1637

MAIL DATE	DELIVERY MODE
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11/14/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/735,081

Applicant(s)

JU ET AL.

Examiner

Mark Staples

Art Unit

1637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 33,39,41,44,47 and 81-89 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 33,39,41,44,47 and 81-89 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>08/17/2007</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

1. Applicants' amendment of claims 33, 39, and 47; the cancellation of claims 1-3, 7-11, 13, 14, 17, 18, 34, 35 and 43; and submission of new claims 81-89 in the paper filed on 08/17/2007 is acknowledged.

Claims 33, 39, 41, 44, 47, and 81-89 are pending and at issue.

Applicants' arguments filed on 08/17/2007 have been fully considered and are deemed to be persuasive to overcome some of the rejections previously applied. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Information Disclosure Statement

2. The filing of a supplemental disclosure statement on 08/17/2007 is acknowledged.

Sequence Rules Compliance

3. It is acknowledged that Applicant has amended the specification to be in compliance with sequence rules.

Rejections that are Moot

Claim Rejections - 35 USC § 103

4. The rejection of claims 34, 35, and 47 is moot as Applicant has canceled these claims.

Rejections that are Maintained

Claim Rejections Maintained - 35 USC § 103

5. The rejection of claims 33, 39, and 41 under 35 U.S.C. 103(a) as being unpatentable over Kolb et al. (April 2001) and Konrad et al. (1998) are maintained.

Applicant's arguments filed 08/17/2007 have been fully considered but they are not persuasive.

Applicant argues that Kolb et al. does not teach linking large molecules. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "large molecule") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). It is noted that amended claims recite a deoxyribonucleic acid but do not specify any size, thus the deoxyribonucleic acid could be a single nucleotide. Furthermore, Kolb et al. alone is not relied upon to teach linking nucleic acids, as Konrad et al. teach linking as well of DNA to plastic beads.

And contrary to Applicant's assertion that Kolb et al. teach away from the use of "click" chemistry due to concerns of safety by medical chemists; Kolb et al. state that

“click” chemistry should be given the attention it deserves due to the remarkable stability of aliphatic azides and other favorable attributes (see last two paragraphs on p. 2015).

Furthermore, Konrad et al. teach attaching deoxyribonucleic acid to a solid surface. It would have been obvious to one of ordinary skill in the art at the time of the claimed invention to substitute the linking “click” chemistry of Kolb et al. into the method of Konrad et al. to yield the predictable result of deoxyribonucleic acid being covalently bound to solid surface. This rationale is simple substitution by one of ordinary skill in the art of the known “click” chemistry of Kolb et al. for the known linking chemistry of Konrad et al to yield predictable results at the time of the claimed invention. This substitution is obvious since Konrad et al. taught covalent linking of DNA to a solid surface and Kolb et al. taught that deoxyribonucleic acid could be linked through the “click” chemistry of the instant invention and that “click” chemistry can be used to link compounds to a solid phase (see section 2.4 on p. 2011).

Konrad et al. also teach why the linking deoxyribonucleic acid to a solid phase is advantageous including uses for mapping, characterizing, and determining the presence of DNA (see Summary of Invention). Kolb et al. further teach that “click” chemistry reliably offers diverse chemical function from a few good reactions (see Title). Both Konrad et al. and Kolb et al. then also provide specific teachings and motivations for combining the “click” chemistry of Kolb et al. with the method of Konrad et al. to link deoxyribonucleic acid to a solid surface.

In closing, Applicant argues further that there is “no rational underpinning” for combining the references and cites *KSR v. Teleflex*, Slip Op No. 04-1350 (April 30,

2007). However the rationale for combining the references is provided in the prior Office action and is elaborated as given above, in response to Applicant's arguments.

The claimed invention is both obvious under a rationale of simple substitution and under the rationale of teaching, suggestion, and motivation. And while Examiner maintains that both Kolb et al. and Konrad et al. provide the specific teaching, suggestion, and motivation to support combining their teachings; such is not necessary for finding of obviousness. KSR forecloses that a *specific* teaching, suggestion, or motivation is required to support a finding obviousness. See the recent Board decision *Ex parte Smith*, --USPQ2d--, slip op. at 20, (Bd. Pat. App. & Interf. June 25, 2007) (citing *KSR*, 82 USPQ2d at 1396) (available at <http://www.uspto.gov/web/offices/dcom/bpai/prec/fd071925.pdf>).

Thus the rejection is maintained.

6. The rejection of claim 44 under 35 U.S.C. 103(a) as being unpatentable over Kolb et al. and Konrad et al. as applied to claim 33 above, and further in view of Lewis et al. (March 2002) is maintained.

Applicant's arguments filed 08/17/2007 have been fully considered but they are not persuasive.

Applicant presents the same arguments as already addressed above and states the rejection of claim 44 should thus be withdrawn. However Applicant's prior arguments are not persuasive and therefore the rejection of claim 44 is maintained.

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7. The rejection of claim 44 under 35 U.S.C. 103(a) as being unpatentable over Kolb et al. and Konrad et al. as applied to claim 33 above, and further in view of Jen et al. (2000) is maintained.

Applicant's arguments filed 08/17/2007 have been fully considered but they are not persuasive.

Applicant presents the same arguments as already addressed above and states the rejection of claim 44 should thus be withdrawn. However Applicant's prior arguments are not persuasive and therefore the rejection of claim 44 is maintained.

New Objections and Rejections Necessitated by Amendment

New Claim Rejections - 35 USC § 103

8. Claims 47, 81-83, and 85-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kolb et al. (April 2001) and Konrad et al. (1998). Claim 47 was rejected as given above in the Office action mailed on 02/15/2007.

Kolb et al. teach as noted above and in the Office action mailed on 02/15/2007.

Regarding claims 85, 86, 88, and 89, Kolb et al. that the alkynyl and the azido group can be prepared prior to combining either with the other for the linking reaction (entire article, especially the 3rd sentence on p. 2012).

Kolb et al. do not specifically teach plastic beads.

Regarding claims 81 and 82, Konrad et al. teach where the biomolecule is n where the DNA oligonucleotides are covalently bound to plastic beads (entire patent, claims 1-4, and for an example of the covalent binding see column 28 line 44 through to column 29 line 29).

Regarding claim 83 and 87, Konrad et al. teach that DNA can be attached through its 5' end (see column 22 line 58).

Konrad et al. do not specifically teach preparation of an alkynyl and the azido group for linking DNA to a solid support.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the method of linking of Konrad et al. using alkynyl and azido groups attached prior to reaction to either the solid support or deoxynucleic acid as suggested by Konrad et al. with a reasonable expectation of success. The motivation to do so is provided by Konrad et al. who teach alkynyl and azido groups can be used as building blocks to readily form the linkage of interest (see for example Scheme 9). Thus, the claimed invention as a whole was *prima facie* obvious over the combined teachings of the prior art.

9. Claim 84 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kolb et al. (April 2001) and Konrad et al. (1998) as applied to claim 47 above, and further in view of Tuncel et al. (1999).

Kolb et al. and Konrad et al. teach as noted above and in the Office action mailed on 02/15/2007. Kolb et al. teach 1,3 dipolar cycloaddition reactions.

Kolb et al. and Konrad et al. do not specifically teach an agent which catalyzes a 1,3 dipolar cycloaddition reaction.

Tuncel et al. specifically teach the agent cucurbituril which catalyzes a 1,3 dipolar cycloaddition reaction (entire article, especially the 4th paragraph on p. 1509).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the methods of Kolb et al. and Konrad et al. for 1,3 dipolar cycloaddition reactions to link DNA to a solid surface by using the catalyst cucurbituril as suggested by Tuncel et al. with a reasonable expectation of success. The motivation to do so is provided by Tuncel et al. who teach the use of the catalyst cucurbituril as a principal way to ensure integer monomer addition in 1,3 dipolar cycloaddition reactions. Thus, the claimed invention as a whole was *prima facie* obvious over the combined teachings of the prior art.

Conclusion

10. Claims 33, 39, 41, 44, 47, and 81-89 are not free of the prior art.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Staples whose telephone number is (571) 272-9053. The examiner can normally be reached on Monday through Thursday, 9:00 a.m. to 6:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on (571) 272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Mark Staples
Examiner
Art Unit 1637
November 8, 2007

MS

Kenneth R. Horlick
KENNETH R. HORLICK, PH.D.
PRIMARY EXAMINER

11/13/07